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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,678	08/25/2003	Farid Fouad Khouri	121798 (1306-17)	3289

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EXAMINER

ZEMEL, IRINA SOPJIA

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/647,678

Applicant(s)

KHOURI ET AL.

Examiner

Irina S. Zemel

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27, 29 and 30 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8-25-2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1- rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for method of reducing the polydispersity of polyetherimids by forming a solution with specified solvents (such as O-DCB, trichlorobenzene, anisole, and veratrole) and contacting the polymer solution with specified anti-solvents (such as toluene, ketones, acetone, tetrahydrofuran, xylenes, and dioxane) does not reasonably provide enablement for method f of reducing the polydispersity of any known polymer, such as polyolefins, polyamides, polyesters, etc., by the recited steps of liquid/liquid extraction. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. As far as claims 1-9, it would clearly require undue experimentation to selecting appropriate solvent/antisolvent combinations for a given polymer, their amount and conditions under which reduction of polydispersity can be achieved. Furthermore, for the claims reciting specific solvents/antisolvents, and the reaction conditions (temperatures, volume), it would require undue experimentation to establish whether or not a given polymer can be extracted b the claimed solvents/antisolvents, and whether the reduction of polydispersity can be achieved with a chosen solvents/antisolvent pair at the claimed

conditions for a given polymer. As far as claims 10-27 and 29-35, while, as discussed above, the invention is enabled for specified solvent/antisolvent pairs, it would require undue experimentation to select all possible solvent/antisolvent combinations within the scope of claim 10 that will allow to obtain polyetherimide with claimed polydispersity of between 1.5 and 2.5. The only claim that currently claims solvent/antisolvent combinations for which the specification is fully enabling is claim 28.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14 and 27-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites a step of forming the polyetherimide by reacting the anhydride with a diamino compound. Reaction of the recited compounds does not result in forming a polyetherimide, rather it results in forming an imide monomer. Applicants are requested to provide clarification whether claim 14 is missing a step of further reacting the imide with dihydroxy-monomer, or it only results in formation of imide, or I should depend on claims 12 or 13.

In claim 27, the second paragraph recites "forming a polyetherimide solution by reacting a halophthalimide produced by reacting a diamino compound selected from the group consisting of m-phenylenediamine and p-phenylenediamine with an anhydride selected from the group consisting of 3-chlorophthalic anhydride, 4-chlorophthalic anhydride, dichloro phthalic anhydride, phthalic anhydride and mixtures thereof, and

then reacting the halophthalimide with bisphenol A disodium salt in the presence of a phase transfer catalyst selected...". It is not apparent what is meant by "reacting a halophthalimide produced by ... and then reacting the halophthalimide with bisphenol...". Applicants are required to provide clarification whether the halophthalimide is pre-reacted with another compound prior to reaction with bisphenol A disodium salt or the halophthalimide is directly reacted with bisphenol A disodium salt.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is, rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,879,419 to Johannessen (hereinafter "Johannessen").

Johansen discloses a method for reducing the polydispersity of a high molecular weight polymer. The disclosed method involves dissolving polyepichlorohydrin diol in dichloroethane solvent, contacting the polymer solution with water/ethanol antisolvent mixture, allowing phase separation, and recovering the polymer with reduced polydispersity from the heavy (organic) phase. The invention as claimed, thus, is fully anticipated by the reference.

Claims 1, 3-6 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,910,559 to Rahman et al., (hereinafter "Rahman").

Rahman discloses a method of fractionating novolak polymers by providing a solution of polymer, adding an antisolvent capable of dissolving low molecular weight species (water/alcohol mixture), but not the high molecular weight polymer, forming two phases and recovering polymer with reduced polydispersity from the heavy fraction. See example 1, fractions A-D. Among suitable antisolvents, ketones and THF are explicitly listed in column 3, lines 48-53. The solution is heated to 95 C, and the amount of antisolvent mixture added to the polymer solution varies from 20 to 50 % (and up) by weight. See example 1. Therefore, the invention as claimed in claims 1, 3-6 is fully anticipated by the Rahman reference.

Claims 1, 3, 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,630,568 to Johnson et al., (hereinafter "Johnston").

Johnston discloses a method for purifications of polyetherimides from low molecular weight species. The low molecular weight species are extracted by adding water to the polyether imide solution. And extracting water soluble low molecular weight species. See column The polyetherimides disclosed in the reference are obtained by reacting bis-halophthalimide (4,4'-CIPAMI) with disodium salt of bisphenol A in the presence in of phase transfer catalyst. See example 1, and description in columns 3, line 55 to column 6, line 52. The polyetherimide are dissolved in a water immiscible solvent such as anisole or diphenylether. See column 6, lines 40-55. The reference also discloses that the process is suitable for various solvents including those with density of 1.1. Those solvents (including explicitly exemplified diphenylether) would necessarily produce heavy polymer containing phase. The reference discloses heating

polymeric solution to temperatures between 25 to 155 C. See column 8, lines 11-22. The reference further disclosed addition of antisolvent (water) to the polymer solution in the amount up to 1/3 (or 2:1 ratio of polymer solution to water) and heating the resulting mixture to various temperatures that fall within the claimed ranges. See column 7, lines 11-22. The invention as claimed, therefore, is fully anticipated by the Johnson reference.

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-11, 16-20, and 22-26 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Johnson.

The disclosure of Johnson reference is discussed above. The reference is silent as to the polydispersity of the polymer after several extractions with water. However, because the polyetherimide is prepared from 4,4'-CIPAMI (and not 3,3'-CIPAMI) and because all of the monomeric and low molecular weight oligomers are expected to be removed by multiple water extraction, it is believed that the resulting product will inherently exhibit polydispersity within the claimed range. The burden is shifted to the applicants to provide factual evidence to the contrary.

Claims 12-15, 27, 29-35 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Johnson.

The disclosure of Johnson reference is discussed above. The reference does not disclose a method of producing bis-halophthalimides. However, claims 12-15 and 27 reciting bis-halophthalimides do not positively recite the steps of producing the bis-halophthalimides, rather these claims are product-by-process steps reciting the product, i.e., bis-halophthalimides, obtained by a specified reaction. In a product-by-process claim, any process limitations are only given weight to the extent that the product obtained by the claimed process is necessarily different from the product disclosed in the reference. In the instant case, the recited product, i.e., bis-halophthalimide is identical in chemical structure to the bis-halophthalimide disclosed in the reference, and, therefore, is believed to have properties identical to the claimed product. The burden is shifted to the applicants to present factual evidence to the contrary.

Claim Rejections - 35 USC § 103

Claims 12-15, 27, and 29-35 are rejected under 35 U.S.C. 103(a) as being obvious over Johnson in combination with US Patent 6,225,866 to Khouri et al., (hereinafter "Khouri").

The applied Johnson reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed

but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

For the purposes of this rejection claim 14 is interpreted as reciting a step of forming an imide monomer by reacting the recited anhydride with a diamino compound. The Johnson reference is silent as to the method of production of bis-halophthalimides, thus implying that bis-halophthalimides produced by any known methods are suitable for the invention disclosed in the Johnson reference. A method of producing bis-halophthalimides via claimed steps is known in the art as evidenced from Khouri (see illustrative example 1). It is also known from applicants' statement of the background of the invention. Therefore, it would have been obvious to use bis-halophthalimides produced by the process disclosed by Khouri with reasonable expectation of adequate

results absent showing of unexpected results that can be attributed to the bis-halophthalimides obtained by the specifically claimed process.

Allowable Subject Matter


Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina S. Zemel whose telephone number is (571)272-0577. The examiner can normally be reached on Monday-Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571)272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ISZ


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